## Chapter 5 Working of Matunga Workshop

### **5.1 Highlights**

• Target for outturn of Matunga Workshop is fixed on the basis of arisings of coaches for POH. The availability of manpower, machinery etc is not taken into calculation at all. The method of fixing the target appears to be unscientific.

(Para 5.8.1)

 Coaches booked by base stations for POH at Matunga workshop are received without the list of missing items prepared jointly by Security, Mechanical and Electrical department. During the period from 2004-05 to 2006-07 fittings valuing Rs.0.87 crore were found missing.

(Para 5.8.2)

• Matunga workshop has taken more than the prescribed time for POH of coaches. Railway suffered loss of Rs.11.82 crore on account of detention to coaches during the 2006-07 alone.

(Para 5.8.4)

 Rejection of periodically overhauled coaches by Neutral Control Wing as well as coaches marked sick within 100 days after they were periodically overhauled indicates the poor workmanship. Railways suffered loss of Rs.3.56 crore on account of detention to rejected coaches.

(Paras 5.8.7 and 5.8.8)

• The expenditure of Rs.12.15 crore incurred on augmentation of POH capacity of the workshop remained unproductive for the last two to three years resulting in non-achievement of projected saving in time taken for POH and consequential loss of Rs.54.28 crore on account of excessive detention to coaches.

(Para 5.8.9)

#### 5.2 Recommendations

- The system of fixing of targets needs to be reviewed to bring into place a more scientific system. The targets need to be fixed keeping in view the resources such as manpower and installed capacity etc.
- Railway should follow the instructions contained in the Maintenance Manual regarding listing of deficiencies of fittings in coaches sent to workshop to eliminate possibility of theft of fittings en-route.
- Keeping in view the high percentage of rejection of periodically overhauled coaches by NCW and also the fact that most of the coaches were falling sick within 100 days, the quality of workmanship needs to be improved.

- Stores procurement and management system needs to be sensitized so that must-change items and vital safety items do not go out of stock.
- Railway should take immediate action to utilize the facilities created at Matunga Workshop to augment the POH capacity so that the intended benefits are derived.

#### 5.3 Introduction

#### 5.3.1 General

The Carriage Workshop, Matunga was set up in 1915 to repair broad gauge and narrow gauge coaches and wagons of the erstwhile Great Indian Peninsular (GIP) Railway. The workshop covers a triangular piece of land of 35 hectares, including a covered area of about 11 hectares, skirted by the Central Railway suburban corridor on the east and the Western Railway corridor on the west. At present the workshop carries out Periodical Overhauling (POH) of all type of coaches including EMU Coaches of the Mumbai suburban section of Central Railway.

Matunga workshop is being certified as ISO 9001:2000 for Quality Management System by Bureau of Indian Standard through audits of documents and work practices since July 2001. Stage wise process and product quality control and acceptance criteria had been defined and regular monitoring of trends in process capability and product quality is being done. The workshop is also the first workshop and fourth unit of Indian Railway to be certified as ISO 14001:1996 being an establishment that had accepted international specification for an environmental management system with effect from June 2002.

#### 5.3.2 Organisation

The workshop is headed by Chief Workshop Manager. He is assisted by three officers viz., Deputy Chief Mechanical Engineer [Dy. CME(R)], Deputy Chief Electrical Engineer [Dy. CEE (G)], and Deputy Chief Electrical Engineer [Dy. CEE (EMU)). Dy. CMM (CWE) is in-charge of Matunga Stores Depot and he is assisted by Sr. Materials Manager and Assistant Materials Manager. The Total sanctioned strength of Matunga Workshop as on March 2007 was 8,854 comprising 730 Supervisors, 6,529 Artisan, 1,592 Un-skilled employees against which 610 Supervisors, 6,231 Artisan, 1,477 Un-skilled were on roll.

#### **5.3.3** Budget and Expenditure

An amount of Rs.245.63 crore was sanctioned as the Final grant for the year 2006-07 as against previous year's actual expenditure of Rs.224.63 crore. The actual expenditure of the Workshop at the end of financial year was Rs.239 crore.

#### **5.3.4** Rolling Stock Holdings

As at the end of April 2006 Central Railway's holding was 383 AC coaches, and 3739 Non-AC coaches. The normal life of steel bodied coaches (including dining/Pantry cars) is 25 years, IRS coaches 30 years and light utilisation

categories coaches 40 years. During the Year 2006-07, 313 AC coaches, and 1877 Non AC coaches were given periodical overhauling by the Matunga Workshop.

### 5.4 Scope of Audit

The performance audit covers maintenance of mainline BG coaches (POH & Heavy Repairs) and all related works done at Carriage Workshop Matunga as per Rolling Stock Programme. The review covers the period from 2004-05 to 2006-07.

## 5.5 Audit Objectives

The main audit objective was to assess the extent to which working of Matunga Workshop is efficient, effective and economical especially with respect to repairs and maintenance of BG coaches. This was further divided into following sub-objectives:

- Whether the planning for POH is done efficiently and as per laid down procedure.
- Whether POH activity, from receipt of a coach to finally dispatch after POH, is done efficiently, effectively and economically.
- Whether effective internal control mechanism is in place at the Workshop.
- Whether all the performance indicators are monitored at appropriate level and timely remedial action taken wherever necessary.
- Whether effective security arrangement is in place to safeguard Railway's assets.

#### 5.6 Audit Criteria

Rules and provisions stipulated in Indian Railway Code for the Mechanical Department (Workshops), instructions issued by Railway Board and Railway Administration from time to time, ISO 9001 & ISO 14001 Reports, Costing Manual & other manuals for the working of workshop were adopted as criteria for assessment of performance of the workshop.

## 5.7 Audit Methodology

Records of CWM/MTN, Dy.CMM/MTN, CWE/CSTM, Yard Master/Dadar and RPF/Inspector MTN were examined in connection with Performance Audit of Working of Matunga Workshop with specific emphasis on repair/maintenance of B G. Coaches for the period from 2004-05 to 2006-07.

#### 5.8 Audit Findings

## **5.8.1** Planning of POH activities

Based on the holding of the various types of rolling stock, Matunga Workshop, in the months of November to January assesses the arising of coaches which are expected to be taken up for POH in the ensuing year and sends the POH programme to Chief Workshop Engineer(CWE) Central

Railway. The CWE sends the same to Railway Board who fixes the targets of coaches to be given periodical overhauling at the Workshop.

The figures of targets for POH fixed for the year 2004-05 to 2006-07 and the actual outturn are given below:

Year	Target	Outturn	Excess/shortfall
2004-05	2160	2195	+35
2005-06	2160	2169	+9
2006-07	2184	2190	+6

Audit noticed that in order to fix the monthly target, the Workshop has assessed the POH capacity as 7.22 coaches per day. The basis for working out per day capacity was not available. Though a large number works for augmentation of POH capacity (discussed in Para 5.8.10) were undertaken and completed during the past six-seven years, the target has remained almost constant indicating that targets were not related to the actual installed capacity with reference to the infrastructure and manpower.

## 5.8.2 Receipt of coaches for POH at the Workshop without deficiency list

Para-119 of the Maintenance Manual for BG coaches of ICF Design stipulate that before sending a coach to workshops, a joint check should be carried out by representatives of mechanical, electrical and security branches and a deficiency list should be prepared in five copies. One copy of the deficiency list should be pasted inside the carriage on one of the end walls and one copy sent to workshops through RPF escorting the coach or by post if the coach is sent unescorted.

Review of the position obtaining at Matunga workshop revealed that the prescribed procedure was not being followed, as deficiency lists were neither found pasted on the walls of coaches nor received separately. Inspection of coaches by the workshop revealed that fittings valuing Rs.0.87 crore were missing in coaches received for POH at Matunga Workshop during the period from 2004-05 to 2006-07.

The prescribed procedure for joint check coaches and preparation of deficiency lists by the division is invariably not followed. In the absence of deficiency list prepared by divisions, the Railways have no mechanism to determine time/place of theft of fittings.

#### **5.8.3** Deficiencies in POH Schedules

As per Maintenance Manual for BG Coaches of ICF Design periodic overhauling of coaches (POH) should be done at specified periodical intervals as shown below:

S. No.	Type of Coaching & Other Vehicle	Periodicity of POH
1.	Passenger coaching Vehicles on Mail and	
	Express rakes	
	(a) Coaches earning less than 2.5 lakh	12 months
	kilometers per annum	
	(b) Coaches earning more than 2.5 lakh	12 months with intermediate
	kilometers per annum	overhauling after 6 months
2.	Passenger coaching Vehicles on other than	18 months
	Mail and Express rakes	12 month for AC coaches
3.	Other Coaching Vehicles on other than	24 months
	Mail and Express rakes	
4.	Rajdhani and Shatabdi Express coaches	POH in workshops after 4
		lakh kilometers or 18 months
		whichever is earlier
		IOH in workshops after two
		lakh kilometers or 9 months
		whichever is earlier.

During the period of review it was noticed that large number of coaches due for POH were retained in service by divisions to meet seasonal traffic demands by revising the date of POH. Mumbai division revised the POH dates of 211 coaches during 2004-05, 296 coaches during 2005-06 and 277 coaches during 2006-07 and allowed them to run on the line. It was also observed that these POH due coaches were run without even changing the 'must change items' which must be changed after certain period is over as prescribed by RDSO. This compromised the safety of passengers and affected the quality of service provided to the rail users.

#### 5.8.4 Excess time taken for POH

As per provisions of Maintenance Manual and Chief Mechanical Engineer's letter of October 1999, the POH of a non-AC and AC coaches is to be completed within 18 and 28 days respectively. Audit scrutiny of records of Matunga Workshop, however, revealed that the Workshop had taken 12246 days (at an average of 38 days per coach) for POH of 393 non AC coaches and 1809 days (at an average of 36.91 days per coach) for 49 AC Coaches during April 2006 to March 2007. Thus the failure of the Workshop to complete the POH within stipulated period of 18 and 28 days for POH of Non AC and AC coaches respectively has resulted in loss of earning capacity of Rs.11.82 crore on account of excess time of 8038 and 437 days taken for POH of 393 Non AC and 49 AC Coaches respectively.

#### 5.8.5 Comparison of unit cost of POH with other workshops

The cost incurred on a specific activity in a workshop is an indicator of the control over expenditure. Less cost indicates better control in achieving economy. A comparison of cost of periodical overhauling of a BG coach incurred by Matunga Workshop with other workshops engaged in similar activities is given below:

(Rs. in thousand)

Names of the	2003-04		2004-0	5	2005-0	6	2006-07	,
Workshop	Cost	Percen-	Cost	Percen-tage	Cost	Percen-	Cost	Percen-
	per	tage at		at Matunga		tage at		tage at
	Coach	Matunga				Matunga		Matunga
Matunga -CR	495		565		621		637.75	
Perambur - SR	351	141	359	157	430	144	434	147
Secundrabad -	279	177	243	233	319	195	NA	
SCR								
Lower Parel -WR	420	118	489	116	528	118	623	102
Gorakhpur -	460	108	445	127	403	154	NA	
NER								

The above comparison revealed that while the cost of periodical overhauling a BG Coach incurred by Lower Parel Workshop of Western Railway was Rs.420 thousand in the year 2003-04, it was Rs.495 thousand (17 per cent higher) at Matunga Workshop. In the same year it was 77 per cent higher when compared to the cost incurred by Secundrabad of South Central Railway. The trend of incurrence of higher cost has been continuing even in the subsequent years. The exact reasons for this could not be ascertained. However, these can be attributed to not following a foolproof system of maintaining actual records of time allowed and consumed in each activity of POH process.

## 5.8.6 Deficiencies in the time allowed and booked in various shops engaged in POH

Audit attempted to trace 60 selected coaches (20 coaches per month for the months of December 2004, April 2005 and September 2006) through the POH process. As pointed out in para 5.8.4, the average time taken for POH exceeds the target time fixed. An attempt was therefore made in Audit to determine the points of detention and the reasons thereof to identify the bottlenecks in the POH process. It was found from the records made available to Audit that information regarding detention or the time taken in various shops for a particular coach could not be determined. On a reference made by Audit, workshop authorities stated that it was not possible for them to make available the actual time taken for each particular coach in each shop. The system followed in the workshop is that the total time allowed for all the coaches turned out by a shop during the month and the total time taken by the staff during the month by the shop are used to arrive at the time saved in order to calculate incentive bonus payable. Neither the time taken in any shop on a particular coach nor the time a coach is stabled or the component of a coach lying in the shop awaiting repair is recorded. Time taken as recorded only considers the time the coach/component is actually attended to in the shop. The time lost while awaiting repairs is not recorded anywhere.

Six out of 12 AC coaches and 28 out of 48 Non AC coaches selected for audit trail were detained beyond allowed time as indicated in the table below:

AC-Coaches			NON AC-Coaches	
Month	Total	Detained Total coaches Detained		
	coaches	coaches		coaches
Dec-2004	4	1	16	4
April-2005	4	4	16	12
Sept-2006	4	1	16	12
Total	12	6	48	28

It was not possible for Audit to identify the points at which the coaches were detained or the reasons for detention as system in place does not provide for maintenance of records to monitor such detention. The absence of appropriate records also hampers the workshop management from identifying the locations and reasons for detention to coaches and taking effective corrective action.

Audit also worked out the time taken on a proportionate basis with reference to total time allowed and time taken in each shop in a month. Out of 34 coaches detained from among the 60 coaches selected for Audit Trail, a detailed analysis of 13 coaches (as given in the table below) pertaining to September 2006 revealed that though these coaches were detained beyond the prescribed period of POH, the time booked for maintenance of these coaches was shown about 30 per cent less than the time allowed. This indicates that the time actually taken was not recorded correctly as these coaches were actually detained beyond the permitted period.

Sr.	Coach	Month	Time	Time	Time	% time
No.	no.		allowed	taken	saved	saved
			(Hrs)	(Hrs)	(Hrs)	
1	454	Sept.06	2086	1453	633	30.35
2	732		2384	1659	725	30.41
3	84430		2589	1758	831	32.10
4	95622		3144	2192	952	30.28
5	98114		3404	2348	1056	31.02
6	91316		3179	2208	971	30.54
7	1226		2659	1874	785	29.52
8	98236		2905	2025	880	30.29
9	83420		2303	1598	705	30.61
10	98241	Aug-	3042	2160	882	28.99
		06				
11	3708		2229	1584	645	28.94
12	86459		2679	1903	776	28.97
13	3422		2068	1463	605	29.25
			34671	24225	10446	30.13

Absence of records to identify time taken on each coach, detention to coaches beyond permissible time, payment of incentive bonus even against coaches detained beyond target time and achievement of target outturn despite average time taken per coach being more than that prescribed point to lacunae in the

system which needs to be studied by Railway Administration so that necessary action wherever required may be taken.

### 5.8.7 High Rejection of periodical overhauled coaches

The system of Neutral control (NC) examination of coaches has been in force at workshop. For this purpose, a cell under the control of Indian Railway Conference Association, New Delhi, headed by Neutral Coach and Wagon Superintendent (NCWS) is functioning in each workshop undertaking POH. The above examination is confined to running gear and certain electrical components of the coaches. Coaches repaired in workshops can be inducted into service only after they are certified fit by NCO. Those having defects are detained for further attention.

Audit scrutiny of Matunga Workshop revealed that about one third of the coaches repaired by Matunga Workshop were rejected by Neutral Control Wing mainly for the reasons such as Air brake not tested, Guard hand brake work incomplete, Commode chutes deficiency, Buffer height excess, Yoke pin rusty , balster clearance deficiency etc. The position of coaches offered for certification and rejected during the period from 2004-05 to 2006-07 is as under-

Year	No. of coaches offered for inspection by NCW	No. of coaches rejected	Percentage of rejection
2004-05	2197	774	35.23
2005-06	2171	860	39.61
2006-07	2155	691	32.06
Total		2325	

Though the deficiencies pointed out by NCW were attended and the coaches were declared fit on the next day, the failure of the Workshop to ensure the faultless working caused delay of one day to each coach resulting in loss of earning capacity for 2325 days amounting to Rs.3.56 crore.

## 5.8.8 Coaches falling sick prematurely

Periodical overhaul of coaches is to be carried out thoroughly so as to enable such coaches to run for the full period until the next overhaul is due. It was seen in audit that over a period of three years from 2004-05 to 2006-07 failure of coaches within 100 days of POH ranged from 17.33% to 22.14% as shown below-

Year	Total coaches periodically overhauled	Number of coaches failed	Percentage of failure
2004-05	2195	486	22.14
2005-06	2169	376	17.33
2006-07	2190	395	18.04

Reasons for failure was stated to be water tank system leaking, Roller bearing defect, Wheel defects, poor furnishing work and other defects such as low wheel grazing, less bolster clearing, screw coupling defective etc.

A further analysis of 146 coaches was done to see the time within which the failure occurred. As can be seen from the facts given below it was noticed that 17 per cent coaches had failed within 10 days, 12 per cent within 11 to 20 days, 30 per cent within 21 to 50 days and 39 per cent within 51 and 100 days.

<b>Total Coaches</b>	Period with in which the coaches failed/ marked sick			
analyzed	Within 10 days	10 to 20 days	20 to 50 days	50 to 100 days
146	26	18	44	58
Percentage of	18	12	30	40
failure with				
reference to				
total checked				

The above facts reflect on the poor workmanship and deficiencies in the identification of defects while inspecting the coaches after completion of periodical overhauling.

# 5.8.9 Impact of non utilisation of facilities created for augmentation of POH Capacity

The work of augmentation of POH capacity of the Workshop with rationalisation of work flow was included in the Works Programme (Pink Book item No.458) of 1999-2000. The detailed estimate of the work for Rs.12.98 crore was sanctioned by Railway Board in January 2000. The main objective of this work was to achieve reduction in time taken for POH of AC Coaches from 28 days to 22 days and non-AC coaches from 18 days to 12 days. As a result of this the Workshop was expected to achieve a net saving of Rs.3.98 crore per annum. The work was targeted for completion within 36 months. The civil works were commenced in March 2000 and completed in December 2004. The Plants and machinery were also procured and commissioned between November 2001 and September 2005. The total expenditure incurred on augmentation of POH capacity up to March 2007 was Rs.12.15 crore.

In this connection the following audit comments arise:

- Though most of the civil works were completed by September 2004, they were not handed over to open line organisation for operation and maintenance. As a result the entire investment of Rs.12.15 crore (Rs.8.08 crore on civil works and Rs.4.07 crore on plant and machinery) is lying unproductive. As a result of non-utilisation of the tracks a lot of plants and trees have grown up in the alignment which would require further expenditure for making it operational.
- Non-utilisation of the facilities has resulted in non-achievement of the intended benefits. The average number of days taken for POH of AC coaches was 23.76 and 23.59 days during 2005-06 and 2006-07 respectively against the target of 22 days. Similarly, for Non-AC coaches, 22.49 days and 20.19 days were taken for POH as against the target of 12 days. This has resulted in loss of earning capacity of coaches to the tune of Rs.54.28 crore.

• The project was expected to streamline the workflow and reduce shunting/marshalling activities. However, it is observed that shunting hours increased over the years as indicated below:

Year	Shunting hours	Shunting charges paid
2004	24544	6,24,54,665
2005	25207	6,83,13,708
2006	25704	8,03,50,800

# **5.8.10** Delay in commissioning of Plant and Machinery procured for augmentation of POH Capacity

Matunga Workshop procured one Vertical Turret Lathe under M& P programme 2003-04 on replacement account through COFMOW. Order was placed in June 2004 and the Machinery received on 14.3.2006. Till date (May-2007) it has not been installed/commissioned because of disagreement regarding the foundation which according to Central Railway should be at least 300 mm above ground level. Thus a machine procured at a cost of Rs.0.92 crore is lying unutilized for more than one and half year. As a result of non-commissioning of the machine, 342 wheels were sent to other workshops for attention resulting in avoidable expenditure on their transportation.

### **5.8.11 Poor Material Management**

As per lists circulated from time to time by RDSO up to October 2006 there were 32 'must change' items, 82 safety related items, 345 other stock items which should be changed during POH of AC coaches. During check of records for the period from January 2005 to December 2006 it was noticed that on an average of 21 per cent "must change" items, 25 per cent of safety items and 26 per cent of stock items remained out of stock. As a result of non-availability of these items, Coaches given periodical overhauling during January 2005 to December 2006 were turned out for traffic operation without changing these items. Besides non-compliance of RDSO's instructions, this has resulted in running of coaches with unsafe conditions.

Besides, Matunga workshop was to complete the 14 works of provision of certain specific items in coaches as stipulated in the RSP-2006-07. However, due to non availability of material the targeted activities could not be completed.

This reflects poor material management. Non completion of this work has denied intended benefits to users of Railway services.

#### 5.8.12 Theft/Pilferage cases in Matunga Workshop

Matunga workshop is surrounded by Road from three sides and the distance of this road is around 3.5kms. The security of the Workshop is deficient as is borne out from the fact that during the period of review there were 15 cases of theft. During the year 2004 one case, in 2005 three cases, in 2006 eight cases and in 2007 three cases were detected by the RPF staff of Matunga workshop. Out of 15 cases in ten cases outsiders entered the Workshop by crossing the

boundary walls through fallen barbed wire or hole in the walls which is under consideration for rebuilding.

#### 5.8.13 Environmental Issues

Matunga Workshop is an establishment that had accepted international specification for an environmental management system and has received ISO 14001:1996 certification with effect from June 2002. As per Maharashtra Pollution Control Board (MPCB), letter dated 2/05/2006 conveying consent to operate under Water and Air (prevention & control of pollution) Acts, hazardous wastes arising in the workshop are to be disposed of through MOEF authorized recyclers.

It was observed that the workshop has awarded a contract on 29 June 2006 to a scrap merchant for removal of waste products from the workshop which included rexine and PVC sheets- items categorized as hazardous substances in MPCB's letter of consent. It is observed that the tender notice did not restrict the bidders to MOEF registered recyclers and the Tender Committee which considered the tenders did not ascertain whether the successful bidder was MOEF registered recycler.

Prescribed procedure has not been followed in the disposal of waste products from the workshop.

It is also observed that effluent and sewage discharge water recycling plant has been approved only during 2007-08 for Matunga workshop costing Rs.29.33 lakh. This is required to be installed urgently.

## **5.8.14 Payment of Incentive Bonus**

Incentive bonus scheme is in vogue from 1960 in Matunga Workshop. Incentive scheme or payment by result was introduced in Indian Railway Workshops to afford financial incentive to workmen who exceeded minimum level of performance. This was to improve productivity and efficient utilization of manpower, machinery and plant based on saving of time by individual employees in performing an activity in lesser time than prescribed. Time is the yardstick for measuring work. The operations involved in workshop were subjected to time study. The "allowed time" was so fixed that a workman of normal ability can earn 33.33 per cent bonus over and above his basic wages.

It was found in Audit that though bonus was paid for the time saved in accordance with the guidelines of the scheme, the bonus paid was not commensurate with the quantum of output achieved. This was because the time saved was not utilized for productive purposes by the Railway Administration. The bonus paid during the period from April 2004 to March 2007 was more to the extent of Rs.4.84 crore when the bonus was worked out with reference to the load lifted.

## 5.9 Conclusion

As brought out the above paragraphs, the system of fixation of targets of coaches for periodical overhauling is not based on the manpower and capacity of the Workshop. The high rate of rejection of periodically overhauled coaches by NCW and failure of significant number of coaches within 10 to 20 days reflects on the poor quality as well as non-adherence of standards. Non-utilisation of augmented POH capacity further indicates that there is lack of monitoring of the proper utilisation of plants and machinery. This has deprived the Railways of the intended benefits of saving in time of POH.

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